

TRANSMITTAL LETTER TO THE UNITED STATES  
DESIGNATED/ELECTED OFFICE (DO/EO/US)  
CONCERNING A FILING UNDER 35 U.S.C. 371

10/018291

INTERNATIONAL APPLICATION NO.  
PCT/DK00/00318INTERNATIONAL FILING DATE  
14 June 2000 (14.06.2000)PRIORITY DATE CLAIMED  
18 June 1999 (18.06.1999)

## TITLE OF INVENTION

Shaping Confectionery Products by Horizontal Extrusion

## APPLICANT(S) FOR DO/EO/US

Mogens RUD

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. ☐ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
  - a. ☐ is attached hereto (required only if not communicated by the International Bureau).
  - b. ☒ has been communicated by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2))
  - a. ☐ is attached hereto.
  - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
  - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
  - b. ☐ have been communicated by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☐ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

## Items 11 to 20 below concern document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A FIRST preliminary amendment.
14. ☐ A SECOND or SUBSEQUENT preliminary amendment.
15. ☐ A substitute specification.
16. ☐ A change of power of attorney and/or address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
18. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. ☐ Other items or information:

10/018291

21. ☒ The following fees are submitted:**BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)):**

Neither international preliminary examination fee (37 CFR 1.482)  
nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$1,040.00  
and International Search Report not prepared by the EPO or JPO. .... ~~\$1000.00~~

International preliminary examination fee (37 CFR 1.482) not paid to  
USPTO but International Search Report prepared by the EPO or JPO ..... \$860.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO  
but international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... \$710.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO  
but all claims did not satisfy provisions of PCT Article 33(1)-(4) ..... \$690.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO  
and all claims satisfied provisions of PCT Article 33(1)-(4) ..... \$100.00

**ENTER APPROPRIATE BASIC FEE AMOUNT =**

Surcharge of \$130.00 for furnishing the oath or declaration later than ☐ 20 ☐ 30  
months from the earliest claimed priority date (37 CFR 1.492(e)).

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	\$
Total claims	- 20 =		x \$18.00	\$
Independent claims	- 3 =		x \$80.00	\$
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$270.00	\$

**TOTAL OF ABOVE CALCULATIONS =** \$ 1,040.00

☐ Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above  
are reduced by 1/2. +

**SUBTOTAL =** \$ 1,040.00

Processing fee of \$130.00 for furnishing the English translation later than ☐ 20 ☐ 30  
months from the earliest claimed priority date (37 CFR 1.492(f)).

**TOTAL NATIONAL FEE =** \$ 1,040.00

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be  
accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +

**TOTAL FEES ENCLOSED =** \$ 1,080.00Amount to be  
refunded: \$

charged: \$

- a. ☒ A check in the amount of \$ 1,080.00 to cover the above fees is enclosed.
- b. ☐ Please charge my Deposit Account No. \_\_\_\_\_ in the amount of \$ \_\_\_\_\_ to cover the above fees.  
A duplicate copy of this sheet is enclosed.
- c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any  
overpayment to Deposit Account No. 02-3704. A duplicate copy of this sheet is enclosed.
- d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. Credit card  
information should not be included on this form. Provide credit card information and authorization on PTO-2038.

**NOTE:** Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR  
1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

James C. Wray  
1493 Chain Bridge Road, Suite 300  
McLean, VA 22101

December 18, 2001

SIGNATURE

James C. Wray

NAME

22,693

REGISTRATION NUMBER

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

MOGENS RUD

Serial No.: To be assigned

Filed: December 18, 2001

For: SHAPING CONFECTIONERY PRODUCTS BY HORIZONTAL EXTRUSION

**PRELIMINARY AMENDMENT**

To the Director of Patents and Trademarks

Sir:

Before considering this application, kindly amend the application as follows:

In the Drawings:

Kindly cancel Figures 20a-22.

In the Abstract:

Kindly enter and approve the abstract attached hereto.

In the Specification:

Kindly replace the paragraph beginning at page 2, line 23, and ending at page 3, line 2, with the following rewritten paragraph:

--By horizontal extrusions of the ice-cream product with profiled cross-section, these are formed lying horizontally on the trays and without lollies. A product made by the horizontal

extrusion is thus commonly known as an ice bar. This product has a largely unchanged cross-section along all of its length and ends with largely parallel end faces. Furthermore, this is disadvantageous because the product is not provided with a lolly which is often desired for having a firm gripping handle in the finished ice-cream product. Because of the orientation of the ice bars in the longitudinal direction of the conveyor, it is not possible to insert or press lollies into these products. This is relieved by a technique described in WO 9901040 where the confectionery products are rotated 90° so that a lolly may be pressed into the confectionery products. These products will, however, have a uniform cross-section over all their length as seen in the direction of extrusion.--

Page 4, before line 1, insert:

**--SUMMARY OF THE INVENTION--.**

Please replace four paragraphs beginning at page 6, line 27, with the following rewritten paragraphs:

Figs. 17-19 show views of different embodiments of a plate forming a part of the shaping means in an apparatus according to the invention, and

Figs. 17a-19a show end views of the plates shown in Figs.

17-19.--

Page 7, before line 1, insert:

**--DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS--**

Page 10, before line 22, insert the following paragraph:

--In the method illustrated in Figs. 6-8 there is also used a sawtooth plate 33 which is disposed immediately in front of the nozzle outlet 32 together with a cutting apparatus 23. An ice-cream body 2'' is formed hereby which, besides the inclined faces 47 and 47', has straight side faces 47' and 48' formed by the cutting apparatus 23. The ice-cream body 2'' appears in Figs. 9-11, where it is shown without lolly. It may, however, be provided with a lolly if desired.--

Page 10, kindly delete lines 31-32.

Page 11, kindly delete lines 1-4.

Kindly replace the paragraph beginning at page 11, line 11, with the following rewritten paragraph:

--In Fig. 17 is seen a plate 33'' having an upper side 41 and a lower side 39 extending in parallel. The plate 33'' has wavy form 42 appearing from the view from above (Fig. 17a), and which runs along the length of the plate. When the plate 33'' is displaced in and out of the run 7, there will be formed a product, the front and rear end faces of which have a shape corresponding to the wavy form, and which may extend inclined or curved, depending on the speed whereby the plate 33'' is displaced. Alternatively, it is possible to provide a profiling at the lower side 39 for shaping the formed product transversely to the direction of extrusion like the profiling provided with the plate 33''.--

Kindly replace the paragraph beginning at page 11, line 28, with the following rewritten paragraph:

--In Fig. 19 is seen a plate 33''' which at its lower side 39 has a car-shaped profiling 43. When the plate 33''' is displaced into and out of the run, a product with shape as a car is formed. This may be given rounded sides by displacing the plate with varying speed.--

Page 12, kindly delete lines 6-10.

In the Claims:

Kindly amend claims 1-10 as follows:

1. (Amended) A method for making a shaped confectionery product by horizontal extrusion with a profiled cross-section as seen in the direction of extrusion, where cutting means are moved transversely to the direction of extrusion for separating the outermost end part from the remaining part of the confectionery run and thus forming the confectionery product where, at least at the separation, there is established an approximately synchronised speed for a receiving conveyor and the confectionery product, wherein shaping means at the nozzle outlet are moved transversely to the direction of extrusion with a speed which is regulated independently of the speed of extrusion so that the confectionery product is imparted a desired profile as seen perpendicularly to the direction of extrusion.

2. (Amended) A method according to claim 1, wherein the shaping means are moved along a curved course.

3. (Amended) A method according to claim 1, wherein the shaping means are moved with differentiated speed through movement past the nozzle outlet.

4. (Amended) A method according to claim 1, wherein confectionery mass with different characteristics are supplied to different parts of the nozzle outlet.

5. (Amended) A method according to claim 1 for making an ice-cream product provided with a lolly, characterised in that the lolly is disposed perpendicularly to the direction of extrusion.

6. (Amended) An apparatus for making a shaped confectionery product by horizontal extrusion, which apparatus comprises a receiving conveyor which is placed under an reciprocating extrusion nozzle, where the nozzle outlet has a profiled cross-section, cutting means which are arranged for moving transversely to the direction of extrusion in order to separate the outermost end part from the remaining part of the confectionery run and hereby form the confectionery product, a device for establishing an approximately synchronised speed for the receiving conveyor and the confectionery product at the cutting, characterised in that by the nozzle outlet there is provided shaping means arranged for being displaced transversely to the direction of extrusion, and that drive means are provided for displacing the shaping means with a speed independent of the speed of extrusion.

7. (Amended) An apparatus according to claim 6, wherein it comprises several supply pipes for supplying different confectionery mass to the nozzle outlet.

8. (Amended) An apparatus according to claim 6, wherein the shaping means comprise a profiled plate disposed immediately before the nozzle outlet, and which is displaced perpendicularly to the direction of extrusion.

9. (Amended) An apparatus according to claim 6, wherein the cutting means are displaced with a speed so that they contribute to the shaping of the product.

10. (Amended) An apparatus according to claim 6 and intended for making an ice-cream product provided with a lolly, characterised in that it comprises a lolly fitting device for inserting the lollies perpendicularly to the direction of extrusion.

**REMARKS UNDER 37 C.F.R. 1.111**

Reconsideration and allowance are respectfully requested.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version with markings to show changes made**".

Applicant has also provided an abstract in compliance with the rules.



Entry of the amendment and consideration and allowance of  
all claims are respectfully requested.

Respectfully,



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December 18, 2001

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification:

The paragraph beginning at line 23 of page 2 and ending at line 2 of page 3 has been amended as follows:

By horizontal extrusions of the ice-cream product with profiled cross-section, these are formed lying horizontally on the trays and without lollies. A product made by the horizontal extrusion is thus commonly known as an ice bar. This product has a largely unchanged cross-section along all of its length and ends with largely parallel end faces. Furthermore, this is disadvantageous because the product is not provided with a lolly which is often desired for having a firm gripping handle in the finished ice-cream product. Because of the orientation of the ice bars in the longitudinal direction of the conveyor, it is not possible to insert or press lollies into these products. This is relieved by a technique described in [DK 172 779] WO 9901040 where the confectionery products are rotated 90° so that a lolly may be pressed into the confectionery products. These products will, however, have a uniform cross-section over all their length as seen in the direction of extrusion.

The four paragraphs beginning at line 27 of page 6 have been amended as follows:

Figs. 17-19 show views of different embodiments of a plate forming a part of the shaping means in an apparatus according to the invention[.], and

Figs. 17a-19a show end views of the plates shown in Figs. 17-19[,,].

[Figs. 20-22 show views illustrating the making and appearance of three different products made according to the invention, and

Figs. 20a-22a show side views of the products shown in Figs. 20-22.]

Lines 31-32 of page 10 have been deleted.

Lines 1-4 of page 11 have been deleted.

The paragraph beginning at page 11, line 11, has been amended as follows:

In Fig. 17 is seen a plate 33'' having an upper side 41 and a lower side 39 extending in parallel. The plate 33'' has wavy form 42 appearing from the view from above (Fig. 17a), and which runs along the length of the plate. When the plate 33'' is displaced in and out of the run 7, there will be formed a product, the front and rear end faces of which have a shape corresponding to the wavy form, and which may extend inclined or curved, depending on the speed whereby the plate 33'' is displaced. Alternatively, it is possible to provide a profiling at the lower side 39 for shaping the formed product transversely to the direction of extrusion like the profiling provided with the plate 33''.

In Fig. 19 is seen a plate 33''' which at its lower side 39 has a car-shaped profiling 43. When the plate 33''' is displaced into and out of the run, a product with shape as a car is formed.

This may be given rounded sides by displacing the plate with varying speed.

Lines 6-10 have been deleted on page 12.

In the Claims:

Claims 1-10 have been amended as below:

1. (Amended) A method for making a shaped confectionery product [(1)] by horizontal extrusion with a profiled cross-section as seen in the direction of extrusion, where cutting means [(33)] are moved transversely to the direction of extrusion for separating the outermost end part from the remaining part of the confectionery run [(7)] and thus forming the confectionery product where, at least at the separation, there is established an approximately synchronised speed for a receiving conveyor [(4)] and the confectionery product, [c h a r a c t e r i s e d in that] wherein shaping means [(33)] at the nozzle outlet [(32)] are moved transversely to the direction of extrusion with a speed which is regulated independently of the speed of extrusion so that the confectionery product is imparted a desired profile as seen perpendicularly to the direction of extrusion.

2. (Amended) A method according to claim 1, [c h a r a c t e r i s e d in that] wherein the shaping means [(33)] are moved along a curved course.

3. (Amended) A method according to claim 1 [or 2], [c h a r a c t e r i s e d in that] wherein the shaping means are

moved with differentiated speed through movement past the nozzle outlet.

4. (Amended) A method according to [any of claims 1-3] claim 1, [c h a r a c t e r i s e d in that] wherein confectionery mass with different characteristics are supplied to different parts of the nozzle outlet.

5. (Amended) A method according to [any preceding] claim 1 for making an ice-cream product [(1)] provided with a lolly, c h a r a c t e r i s e d in that the lolly [(3)] is disposed perpendicularly to the direction of extrusion.

6. (Amended) An apparatus for making a shaped confectionery product [(1)] by horizontal extrusion, which apparatus comprises a receiving conveyor [(4)] which is placed under an reciprocating extrusion nozzle [(20)], where the nozzle outlet [(32)] has a profiled cross-section, cutting means [(23,24)] which are arranged for moving transversely to the direction of extrusion in order to separate the outermost end part from the remaining part of the confectionery run [(7)] and hereby form the confectionery product [(1)], a device for establishing an approximately synchronised speed for the receiving conveyor [(4)] and the confectionery product [(1)] at the cutting, c h a r a c t e r i s e d in that by the nozzle outlet [(32)] there is provided shaping means [(24,33)] arranged for being displaced transversely to the direction of extrusion, and that drive means [(26,35)] are provided for displacing the

shaping means [(24,33)] with a speed independent of the speed of extrusion.

7. (Amended) An apparatus according to claim 6, [c h a r a c t e r i s e d in that] wherein it comprises several supply pipes [(22)] for supplying different confectionery mass to the nozzle outlet [(32)].

8. (Amended) An apparatus according to claim 6 [or 7], [c h a r a c t e r i s e d in that] wherein the shaping means comprise a profiled plate [(33)] disposed immediately before the nozzle outlet [(32)], and which is displaced perpendicularly to the direction of extrusion.

9. (Amended) An apparatus according to [any of claims 6-8] claim 6, [c h a r a c t e r i s e d in that] wherein the cutting means [(24)] are displaced with a speed so that they contribute to the shaping of the product.

10. (Amended) An apparatus according to [any of claims 6-9] claim 6 and intended for making an ice-cream product provided with a lolly, c h a r a c t e r i s e d in that it comprises a lolly fitting device [(11)] for inserting the lollies [(3)] perpendicularly to the direction of extrusion.

## SHAPING CONFECTIONERY PRODUCTS BY HORIZONTAL EXTRUSION

### **Background of the invention**

5 The present invention relates to a method for making a shaped confectionery product by horizontal extrusion with a profiled cross-section as seen in the direction of extrusion, where cutting means are moved transversely to the direction of extrusion for separating the outermost end part from the remaining part of the confectionery run and thus forming the confectionery product, where, at least at the separation, there is established an approximately synchronised speed for a receiving conveyor and the confectionery product.

10 The invention also concerns an apparatus for making a shaped confectionery product by horizontal extrusion, which apparatus comprises a receiving conveyor which is placed under an reciprocating extrusion nozzle, where the nozzle outlet has a profiled cross-section, cutting means which are arranged for moving transversely to the direction of extrusion in order to separate the outermost end part from the remaining part of the confectionery run and hereby form the confectionery product, a device for establishing an approximately synchronised speed for the receiving conveyor and the confectionery product at the cutting.

15 20 In particular, the invention concerns making confectionery products in the form of ice-cream products. However, the invention may also be used in connection with making other confectionery products provided with lolly, as for example lollipops. The problem and the advantages by the invention will, however, be explained specifically under consideration to making ice-cream products.

25 30 When making ice lollies it is known that the vertical extrusion implies great freedom with respect to shaping the formed product. Thus there will be very great freedom in designing the extruder nozzle. It is possible to make ice lollies shaped with a desired shape as seen in the direction of extrusion. For example, ice lolly figures containing one or more colours, ice-cream with different flavours added, water ice products or combined products containing ice-cream and water ice.

The vertically extruded ice-cream products may be produced with or without an inserted lolly. It will be possible to extrude the products into cups.

5 The confectionery product is produced by a run of continually extruded ice-cream mass which is cut off at the extruder nozzle and then placed on a conveyor belt running below the nozzle. Since the cutting of the formed run of extrude confectionery mass occurs perpendicularly to the direction of extrusion, such products will get a shape delimited by two parallel surfaces.

10 It is also known to extrude an ice-cream product by horizontal extrusion of an ice-cream run which is cut off and laid off onto a continually driven conveyor where the direction of extrusion and the movement of the conveyor are in the same direction. In this kind of extrusion there is freedom in shaping the products in the direction of extrusion. It will be possible to impart different cross-sectional shapes to the product with one or more colours of ice-cream disposed side-by-side as seen in the longitudinal/extruding direction of the formed product. It will also be possible to rotate the nozzle of the extruder so that twisted products are produced. Furthermore, it will be possible move all of the extruder head or the extruder nozzle to and fro in the direction of extrusion, or laterally in relation to the direction of extrusion, so that wavy products are formed. By this way of extrusion greater degrees of freedom in shaping the product occur.

25 By horizontal extrusions of the ice-cream product with profiled cross-section, these are formed lying horizontally on the trays and without lollies. A product made by the horizontal extrusion is thus commonly known as an ice bar. This product has a largely unchanged cross-section along all of its length and ends with largely parallel end faces. Furthermore, this is disadvantageous because the product is not provided with a lolly which is often desired for having a firm gripping handle in the finished ice-cream product. Because of the orientation of the ice bars in the longitudinal direction of the conveyor, it is not possible to insert or press lollies into these products. This is relieved by a technique described in DK 172 779 where the confectionery products are rotated 90° so that a lolly may be pressed into the confectionery products. These prod-

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ucts will, however, have a uniform cross-section over all their length as seen in the direction of extrusion.

Also, a kind of horizontal extrusion is known, making possible insertion of lollies in the formed ice-cream body. When the first run of ice-cream has left the extrusion nozzle, a lolly is inserted in the end part. When the run is cut off for achieving the desired length of the confectionery, the finished product falls down on the conveyor moving the product through a subsequent freezing tunnel.

This product is also made with a largely uniform cross-section as seen in the direction of extrusion and is delimited by largely parallel end faces as seen perpendicularly to the direction of extrusion.

The known methods for making ice-cream product are thus all connected with limitations to the shape that the product may have perpendicularly to the direction of extrusion.

There is a demand for ice-cream products with new shapes, and it is particularly desirable to make products with three-dimensional shape having varying cross-section in the direction of extrusion and perpendicularly thereto, and which simultaneously may be composed of different types of ice-creams/water ices, and where different patterns are formed along the length of the product. This demand cannot be met by known extrusions. Such products are therefore formed by means of moulds. However, this is a process which has limited capacity as compared with extrusion. It is desirable to be able to extrude such products. These may be ice-cream products or other confectionery products which are made with a three-dimensional shape having varying cross-section as seen in the direction of extrusion and perpendicularly thereto, and which simultaneously can be made of different kinds of ice-cream and/or with different colours of ice-cream as well as contain water ice, stripes of juice, chocolate and caramel, and other edible pastas.

With the present invention there is indicated a method and apparatus making possible production of a confectionery product that meets these demands.

5 The method according to the invention is thus peculiar in that shaping means at the nozzle outlet are moved transversely to the direction of extrusion with a speed which is regulated independently of the speed of extrusion so that the confectionery product is imparted a desired profile as seen perpendicularly to the direction of extrusion.

10 The apparatus according to the invention is peculiar in that at the nozzle outlet there is provided shaping means arranged for being displaced transversely to the direction of extrusion, and that drive means are provided for displacing the shaping means with a speed independent of the speed of extrusion.

15 With the present invention it appears to be possible to make confectionery products having varying cross-section as seen in the direction of extrusion and perpendicularly thereto. The profiled nozzle outlet thus imparts the product a shape or a cross-section as seen in the direction of extrusion. By varying the speed whereby the shaping means are transversely displaced simultaneously with extruding the confectionery run with a well-defined speed, the end faces formed at the front and the rear side of the product  
20 may be imparted an inclined, straight, wavy or other curved shape that may be different from the front and the rear face as seen perpendicularly to the direction of extrusion. It is possible to use one or more shaping means which are inserted into the confectionery run from one or more sides in order to give the product the desired shape.

25 The shaping means most often comprise a wire. Hereby is formed a rectilinear section in direction perpendicular to the direction of extrusion. However, it is also possible to use shaping means with a curved profile. By using shaping means with a curved profile as seen in direction in parallel with the extrusion, it is possible to shape the front and the rear end face with an arbitrary shape as seen perpendicularly to the extrusion  
30 and as seen perpendicularly to the displacing of the shaping means. It is important that the other shaping means are placed in close contact with the nozzle outlet so that retained confectionery product is retained in the nozzle outlet. If this is not the case,

excessive or cut parts of the confectionery mass will fall down onto the receiving conveyor and dirty it and making subsequent process steps more difficult. By using a plate with a saw-tooth profile, for example, being displaced partly into the confectionery run, it will be possible to form a product with saw-tooth shape with inclined side/end edges. By using shaping means having shape as a car as seen from the side, it will be possible to make a car with curved sides. This shape may be supplemented with different colours when several supply tubes with different ice-cream types/colours for the nozzle, so that a product becoming more natural by the colouring is formed.

By using shaping means with a curved profile as seen in direction perpendicularly to the extrusion, i.e. profiled along their whole length extending transversely of the confectionery run, it becomes possible to form the front and rear end face of the product with a shape corresponding to the profiling. For example, by using a plate with a semicircular profile it is possible to shape the product with rounded end parts. If oppositely directed profiles are used alternately and they are displaced with differentiated speed perpendicularly to the run, it is possible to form hemispherical or spherical products.

It is possible to displace the shaping means completely through the confectionery run. Hereby the need for special cutting means is avoided. In the alternative, the shaping means are only partly moved through the confectionery run, and the product is separated from the run by means of special cutting means. These may, for example, comprise a wire known per se which is moved through the confectionery run at a time where the nozzle stands still in an outer position in a reciprocating movement. Alternatively, the wire is displaced together with a reciprocating nozzle for forming a sectional surface which is perpendicular to the direction of extrusion. It is also possible to displace the cutting means through the run while the speed for the nozzle and the cutting means is differentiated in the direction of extrusion, thereby forming an inclined cut surface. The cutting means may hereby take part in shaping the product in a desired way.

When a confectionery product provided with lolly is made, for example an ice lolly, it is possible to place the lolly by means of a lolly inserter. This may take place by inserting the lolly into the product in direction perpendicular to the direction of extrusion. Hereby it is possible to achieve a great speed in production. Alternatively, it is also possible to insert the lolly in other directions, for example in parallel with the direction of extrusion.

### Brief description of the drawing

The invention will now be explained more closely with reference to the accompanying schematic drawing, where

Fig. 1 shows a schematic, partial plane view for illustrating an apparatus for making confectionery products by a method according to the invention,

Fig. 2 shows a partial side view for illustrating the apparatus according to the invention,

Fig. 3 shows a view corresponding to Fig. 2, but for illustrating a second embodiment of the apparatus according to the invention,

Fig. 4 shows a partial side view of a third embodiment of an apparatus according to the invention,

Fig. 5 shows an end view of the apparatus shown in Fig. 4,

Figs. 6-8 show side views of a method for extruding a confectionery product,

Figs. 9-11 show side views of an ice-cream body made by the method shown in Figs. 6-8,

Figs. 12-14 shows three views of an ice-cream product made by using the apparatus shown in Figs. 4 and 5,

Figs. 15-16 show a view of a detail of the apparatus according to the invention,

Figs. 17-19 show views of different embodiments of a plate forming a part of the shaping means in an apparatus according to the invention,

Figs. 17a-19a show end views of the plates shown in Figs. 17-19,

Figs. 20-22 show views illustrating the making and appearance of three different products made according to the invention, and

Figs. 20a-22a show side views of the products shown in Figs. 20-22.

In Fig. 1 is seen an apparatus for use in making ice-cream products 1 formed by an ice-cream body 2 in which a lolly 3 is inserted. The apparatus comprises a tray conveyor 4 with a number of trays 5 onto which the ice-cream products 1 are laid. The apparatus comprises an extruder 6 extruding runs of ice-cream mass 7 onto the trays 5.

5 This occurs by simultaneously extruding four runs of ice-cream mass 7 disposed side-by-side on the trays 5.

10 The shown apparatus furthermore comprises a turning apparatus 8 which is disposed after the extruder 6. In this turning apparatus, the trays 5 are rotated about a vertical axis in direction of the arrow 9, the axis being perpendicular to the horizontally oriented trays 5. The trays are rotated 90° so that the ice-cream products 1 are rotated from the extruded orientation with a length in direction of the direction of transport 10 of the conveyor to a position where they are disposed perpendicularly to the direction of transport 10. Alternatively, the apparatus may be made without the turning apparatus 8.

15 The apparatus further comprises a lolly inserter 11 which is disposed after the turning apparatus 8. The lolly inserter may be of a kind known per se which presses the lollies horizontally into the formed products. The tray conveyor 4 then moves the products into a freezing tunnel 12. The conveyor is moved into the freezing tunnel at the point 13 and out of the freezing tunnel 12 at the point 14 with the frozen ice-cream products placed on the trays 5.

20 Furthermore, the apparatus comprises a robot 15 for removing the frozen ice-cream products 1. In the embodiment shown, the robot 15 is arranged for removing a total of eight ice-cream product 1 at a time corresponding to the number of ice-cream products located on two juxtaposed trays 5. The robot furthermore comprises a lamella belt 16 which moves the products to further processing or packing.

30 The apparatus comprises a further turning apparatus 17 which may rotate the trays 90° about a vertical axis according to arrow 18. Hereby the trays are imparted the same orientation as the original. The further turning apparatus 17 is only necessary if trays

are used having indentations as indicated by 19. The indentations 19 serve to receive the frozen confectionery products so that they are imparted a desired shaped without being deformed because of a plane upper side of the trays 5.

5 If the trays are made without indentations, and ice-cream products 1 are made with three-dimensional shape which may lie on a plane tray, the further turning apparatus 17 may be omitted. If the trays 5 have a length/width ratio necessitating passage through the freezing tunnel 12 with a certain orientation of the trays 5, the further turning apparatus 17 will be necessary.

10 The trays could be traditional trays used in tray conveyors, having a width up to 400-500 mm. Preferably, the trays will have a length of about 300 mm. This makes possible production of confectionery products in lengths between 100 and 400 mm. The length of the formed ice-cream product is thus only limited by the width of the trays 5.  
15 The products could be formed with an optional, three-dimensional shape, but are illustrated schematically in Fig. 1.

In Fig. 2 is seen a more detailed side view of the extruder 6. The extruder comprises extruding nozzles 20. The nozzles 20 are reciprocating in order to achieve a synchro-  
20 nisation of the speed of the nozzle and the speed of the trays 5, when the ice cream bodies 2 are cut off the run 7. These are provided in a number of four in the embodiment shown. The extruding nozzles 20 are connected with supply tubes 21,22 for supplying different kinds of ice-cream/water ice.

25 The ice-cream run 7 leaving the nozzles 20 is formed to desired shape by means of shaping means 31 mounted at the outlet 32 of the nozzles 20, and which are arranged for displacing transversely of the direction of extrusion. The shaping means 31 comprises a plate 33 that may be moved completely or partly through the run 7 for giving it a desired profile in the longitudinal and transverse direction, depending on the shape  
30 and advancing speed of the plate 33.

The plate 33 is fitted to a piston 34 which is mounted in a activating unit 35 and driven with a speed that may be regulated independently of the the speed of extrusion of the run 7. An electric stepping motor may be used in order to achieve the required security in controlling the movement of the plate 33. The controlling may occur by means of an electronic control unit (not shown).

In the embodiment shown there is provided a cutting apparatus 23 which is used for cutting off the shaped ice-cream body 2 from the run 7. The cutting apparatus may be done without if the plate 33 is used for a complete cutting through of the run 7. The cutting apparatus 23 comprises a wire 24 known per se disposed between two side pieces 25 that may be moved up and down by means of a pressurised air cylinder 26, thereby cutting the run 7. The cutting apparatus 23 is kept stationary. The extruding head 6 is oscillated to and fro in the direction of movement 10 of the conveyor for establishing the desired length of the ice-cream bodies.

When a body 2 is cut off the run 7, the extruder is withdrawn for creating the desired distance between succeeding bodies 2 and thereby also to create the desired length of each body 2. This length may be varied optionally by adjusting the stroke and speed of the extruder head 6, the extrusion speed and the conveyor speed. The desired three-dimensional ice-cream bodies 2 are hereby formed on the trays 5.

In the embodiment shown, it appears that the formed ice-cream bodies 2 have a considerable length which substantially correspond to the width of the trays 5. It is also possible to make short bodies 2.

The nozzle 20 of the extruder is placed under a small angle 27 in relation to horizontal. The extrusion is thus performed as a horizontal extrusion. The angle 27 may be between 0 and 10°, but is preferably under 5°. The lower corner 28 of the nozzle 20 is situated at a very short distance immediately over the surface 29 of the trays 5. This distance is conditioned by a low, turned-in edge 30 on the trays. The lower corner 28 of the nozzle may in principle be provided immediately over the surface 29 of the trays.

In order to place the lower corner 28 of the nozzle 20 as close as possible to the surface on which the ice-cream bodies are placed, the receiving conveyor may instead be provided as an unbroken conveyor belt 36 as shown in Fig. 3. The corner 28 may be placed immediately over the surface 37 of the conveyor belt 36. The risk of deforming the ice-cream bodies is hereby avoided when they are laid off on the surface 37.

In Figs. 4 and 5 are seen a third embodiment for an apparatus according to the invention. Identical or corresponding elements are designated with same reference numbers and hence will not be explained in detail.

In this embodiment there is only illustrated a single nozzle 20. A special cutting apparatus is not used. The apparatus shown is arranged for making an ice-cream product 1' as illustrated in Figs. 12-14, and separation of the product from the run 7 occurs only by using shaping means in the form of a plate 33A.

The nozzle outlet 32 in the form shown is made with a sawtooth cross-section (see Fig. 5). There is used a plate 33A which due to rigidity has turned-in side edges 45 at the lower part 44 of the plate. It appears that the side face 46 of the plate is disposed in immediate contact with the nozzle outlet 32 in order to avoid ice-cream mass unintended penetrating out at the sides of the plate 33A.

In Figs. 12-14 are seen three side views of an ice-cream product 1'. This has a sawtooth shaped design as seen in Fig. 13. This shape is formed in the direction of extrusion by means of the cross-section of the nozzle outlet 32. In direction perpendicularly thereto as illustrated in Fig. 14, the product has a mainly triangular shape. The inclined side faces 47 and 48, respectively, are formed by the movement of the plate 33A transversely to the direction of extrusion 10. The surface 47 is formed by the inclined side face 45 of the plate 33A, and the face 48 is formed by the straight side face 46 of the plate 33A which is moved out of the ice-cream run 7 at controlled speed.

In the method illustrated in Figs. 6-8 there is also used a sawtooth plate 33 which is disposed immediately in front of the nozzle outlet 32 together with a cutting apparatus



23. An ice-cream body 2'' is formed hereby which, besides the inclined faces 47 and 47', has straight side faces 48' and 48'' formed by the cutting apparatus 23. The ice-cream body 2'' appears in Figs. 9-11, where it is shown without lolly. It may, however, be provided with a lolly if desired.

Fig. 15 illustrates a nozzle outlet 32 as seen from above. It is provided with a vertical slot 32' covered by a elongate, vertical knob 44 which is placed on a plate 33B. Hereby it becomes possible to form ice-cream bodies 2'' as illustrated in Fig. 16 with cuts 45 in the sides 47,48.

In Fig. 17 is seen a plate 33' having an upper side 41 and a lower side 39 extending in parallel. The plate 33' has wavy form 42 appearing from the view from above (Fig. 17a), and which runs along the length of the plate. When the plate 33' is displaced in and out of the run 7, there will be formed a product, the front and rear end faces of which have a shape corresponding to the wavy form, and which may extend inclined or curved, depending on the speed whereby the plate 33' is displaced. Alternatively, it is possible to provide a profiling at the lower side 39 for shaping the formed product transversely to the direction of extrusion like the profiling provided with the plate 33''.

In Fig. 18 appears a plate 33' which at its upper side 41 has a rod 38 for fastening to the piston 34. At its lower side 39, the plate has a sawtooth profiling 40. When the plate 33' is displaced into and out of the run 7, a sawtooth shaped product may be formed. A correspondingly shaped product may be formed by using a nozzle outlet with the sawtooth profile and a plate with a rectilinear lower edge for cutting off the run 7.

In Fig. 19 is seen a plate 33'' which at its lower side 39 has a car-shaped profiling 43. When the plate 33'' is displaced into and out of the run, a product with shape as a car is formed. This may be given rounded sides by displacing the plate with varying speed.

When plates 33 having a wavy or curved shape transversely to the direction of extrusion are used, as for example shown in Fig. 17, it is important that the nozzle outlet 32 has a corresponding shape. Hereby the plate 33 is in close contact with nozzle outlet in order to avoid excessive confectionery mass penetrating out from the nozzle outlet.

5

Figs. 20 - 22a illustrate alternative embodiments of products 1 provided with lollies and made by a method according to the invention, and which are illustrated in Figs. 20-22, where the nozzle outlet 32 imparts the profiling to the products 1, and where the products are cut off by first shaping means provided in the form of a wire 24 which forms a cut that is largely perpendicular to the extrusion.

10

## CLAIMS

1. A method for making a shaped confectionery product (1) by horizontal extrusion with a profiled cross-section as seen in the direction of extrusion, where cutting means (33) are moved transversely to the direction of extrusion for separating the outermost end part from the remaining part of the confectionery run (7) and thus forming the confectionery product where, at least at the separation, there is established an approximately synchronised speed for a receiving conveyor (4) and the confectionery product, characterised in that shaping means (33) at the nozzle outlet (32) are moved transversely to the direction of extrusion with a speed which is regulated independently of the speed of extrusion so that the confectionery product is imparted a desired profile as seen perpendicularly to the direction of extrusion.
2. A method according to claim 1, characterised in that the shaping means (33) are moved along a curved course.
3. A method according to claim 1 or 2, characterised in that the shaping means are moved with differentiated speed through movement past the nozzle outlet.
4. A method according to any of claims 1 - 3, characterised in that confectionery mass with different characteristics are supplied to different parts of the nozzle outlet.
5. A method according to any preceding claim for making an ice-cream product (1) provided with a lolly, characterised in that the lolly (3) is disposed perpendicularly to the direction of extrusion.
6. An apparatus for making a shaped confectionery product (1) by horizontal extrusion, which apparatus comprises a receiving conveyor (4) which is placed under an reciprocating extrusion nozzle (20), where the nozzle outlet (32) has a profiled cross-section, cutting means (23,24) which are arranged for moving transversely to the direction of extrusion in order to separate the outermost end part from the remaining part

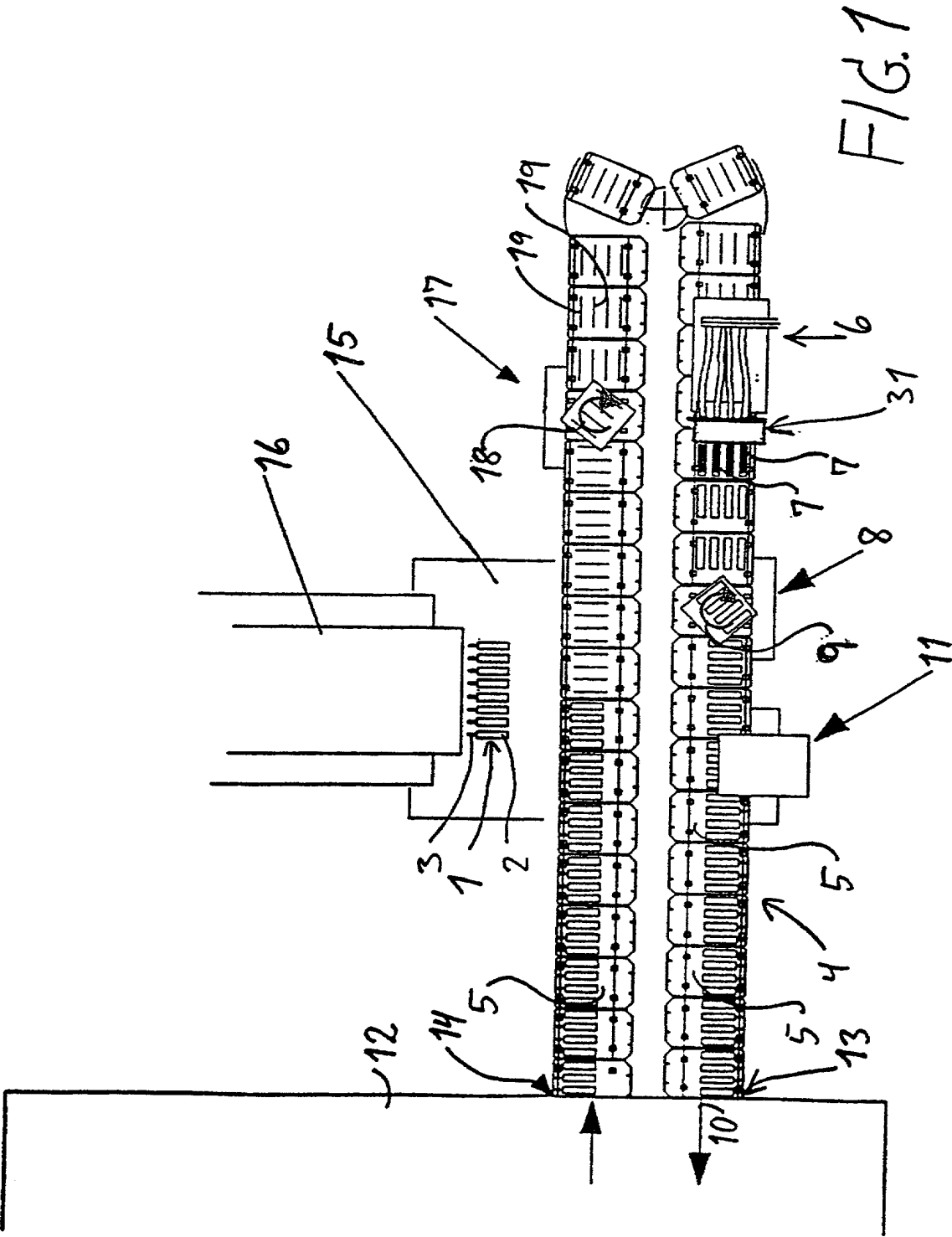
of the confectionery run (7) and hereby form the confectionery product (1), a device for establishing an approximately synchronised speed for the receiving conveyor (4) and the confectionery product (1) at the cutting, characterised in that by the nozzle outlet (32) there is provided shaping means (24,33) arranged for being displaced transversely to the direction of extrusion, and that drive means (26,35) are provided for displacing the shaping means (24,33) with a speed independent of the speed of extrusion.

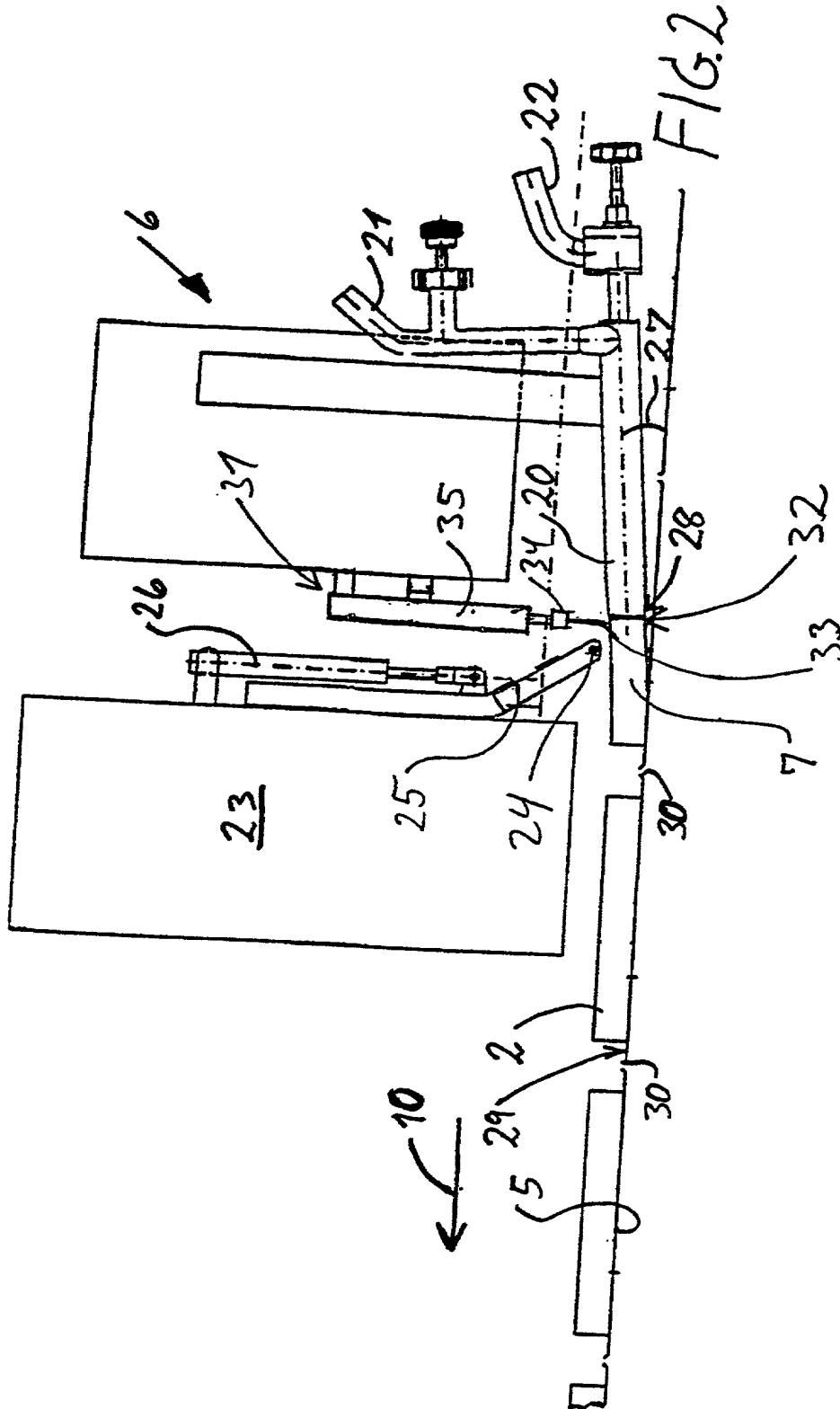
7. An apparatus according to claim 6, characterised in that it comprises several supply pipes (22) for supplying different confectionery mass to the nozzle outlet (32).

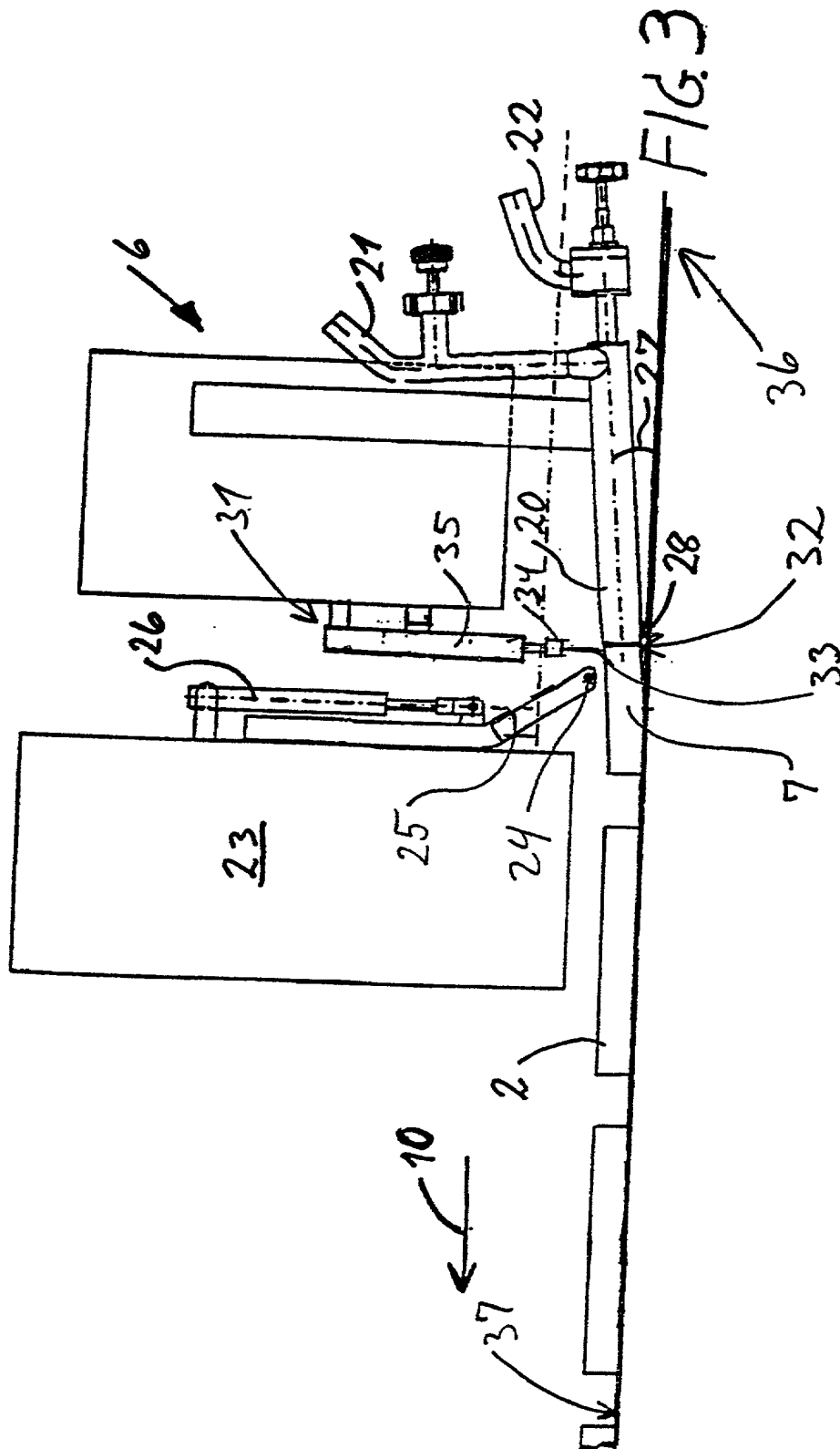
8. An apparatus according to claim 6 or 7, characterised in that the shaping means comprise a profiled plate (33) disposed immediately before the nozzle outlet (32), and which is displaced perpendicularly to the direction of extrusion.

9. An apparatus according to any of claims 6 - 8, characterised in that the cutting means (24) are displaced with a speed so that they contribute to the shaping of the product.

10. An apparatus according to any of claims 6 - 9 and intended for making an ice-cream product provided with a lolly, characterised in that it comprises a lolly fitting device (11) for inserting the lollies (3) perpendicularly to the direction of extrusion.







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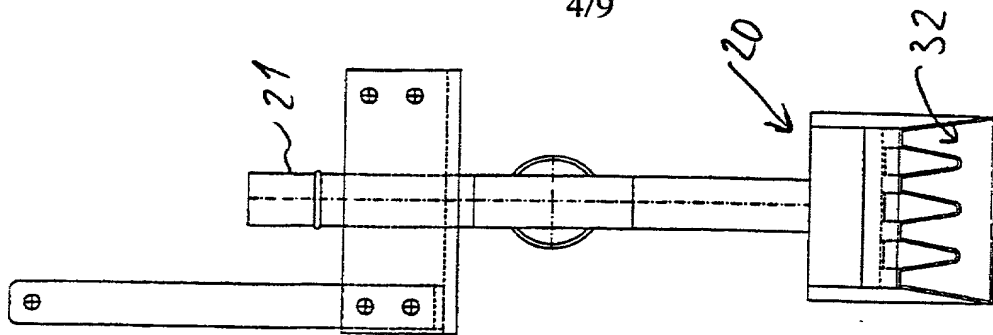


FIG. 5

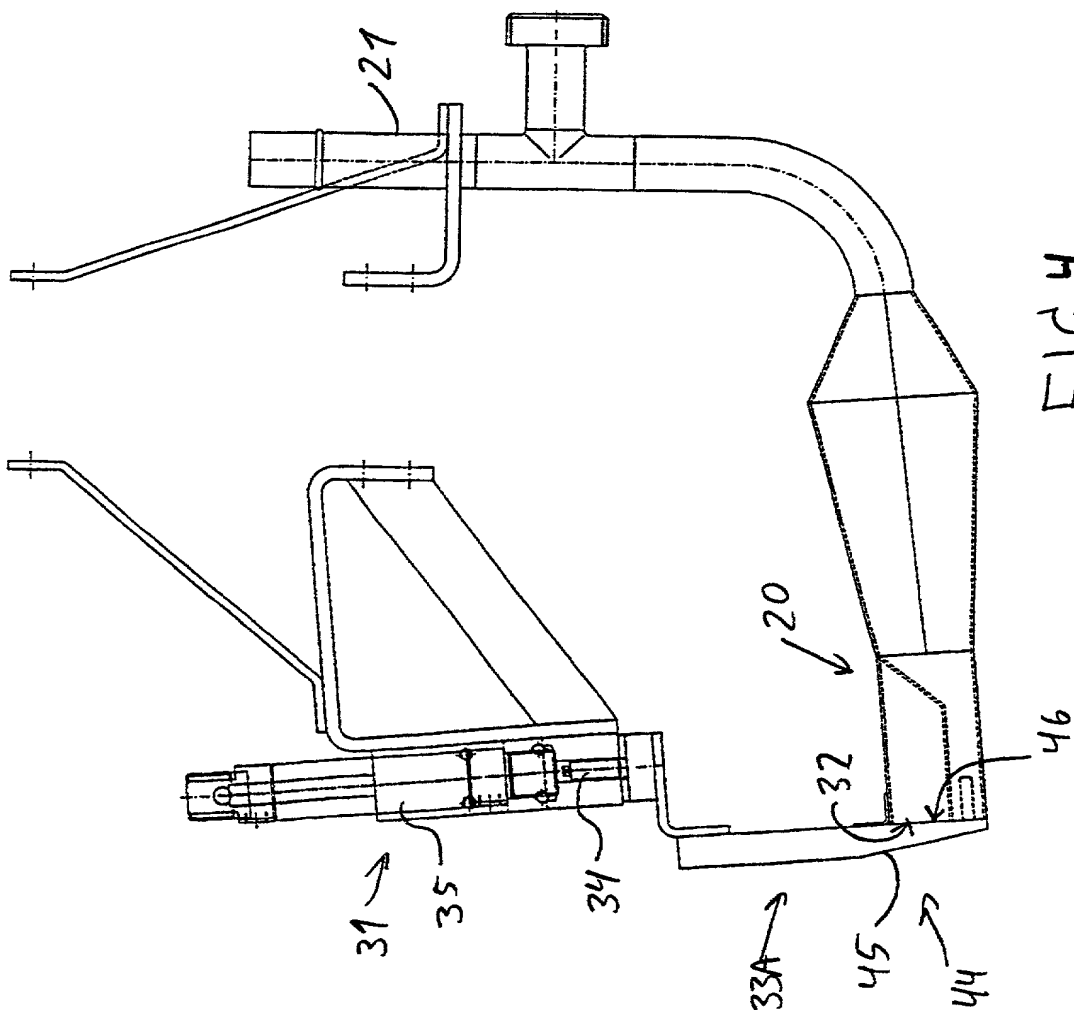
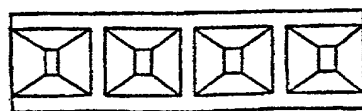
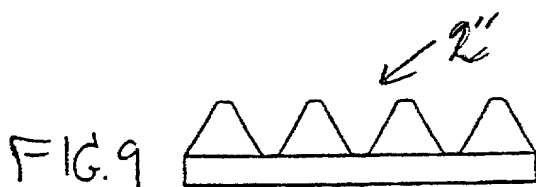
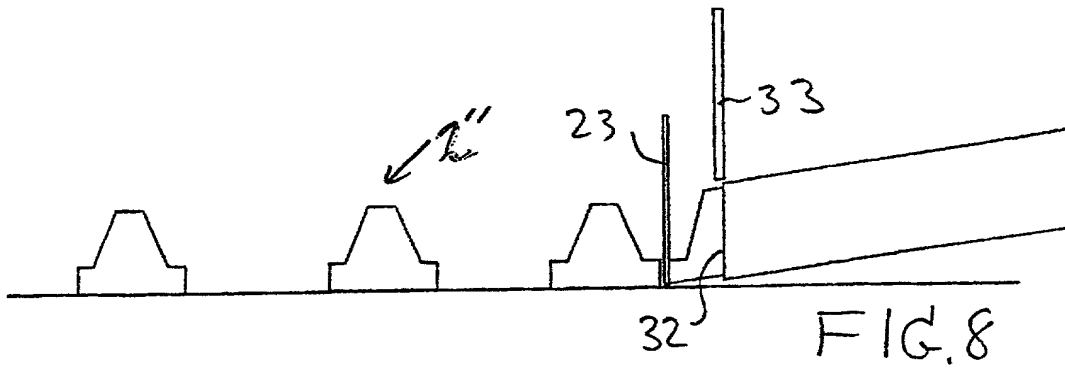
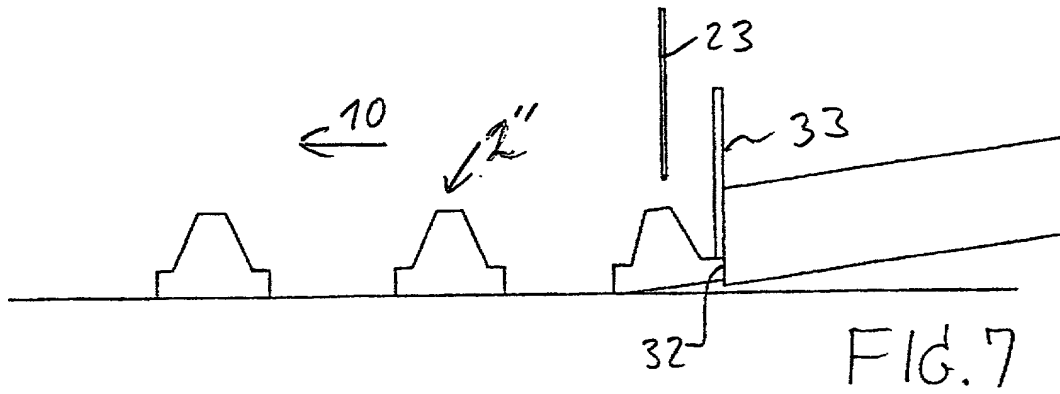
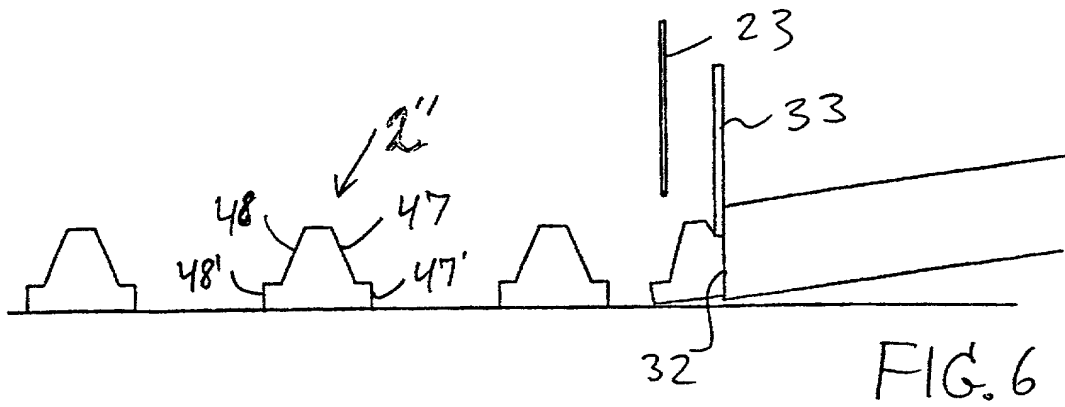


FIG. 4



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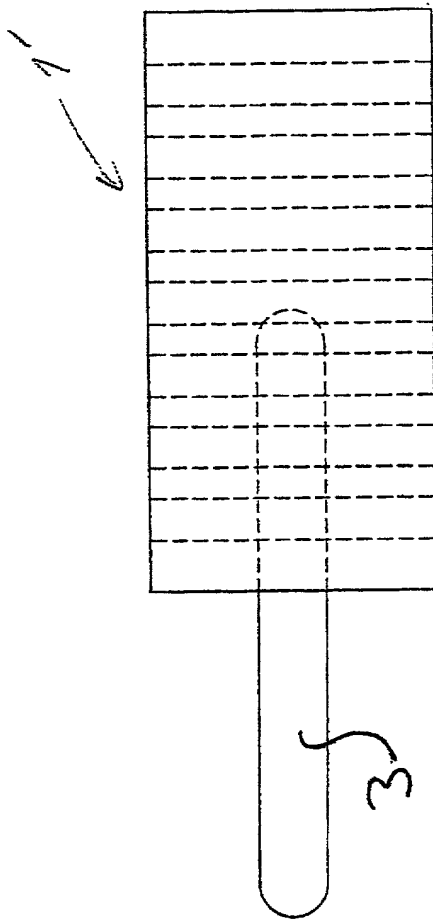


FIG. 12

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1'

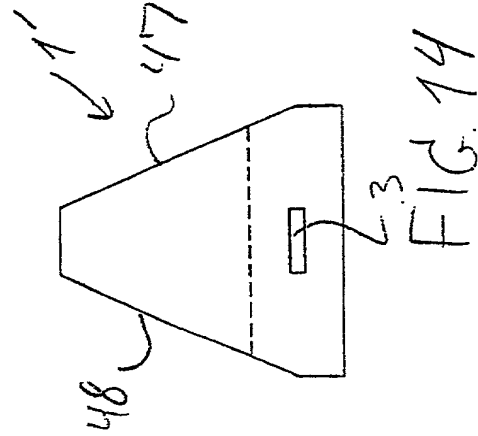


FIG. 14

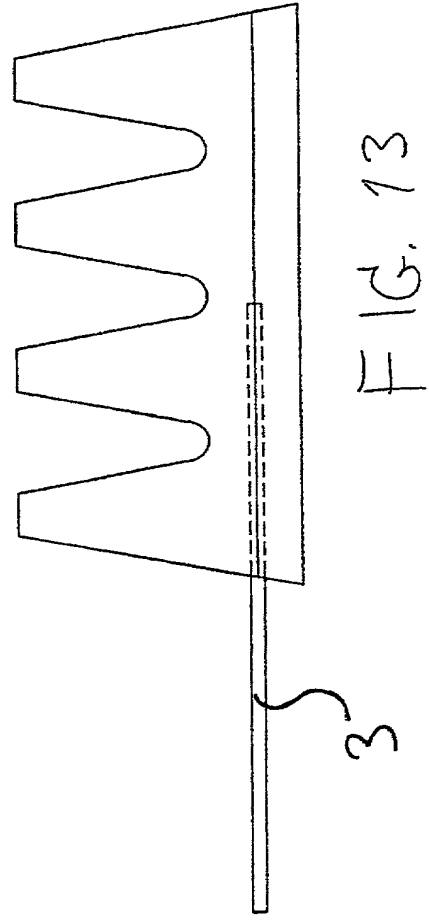
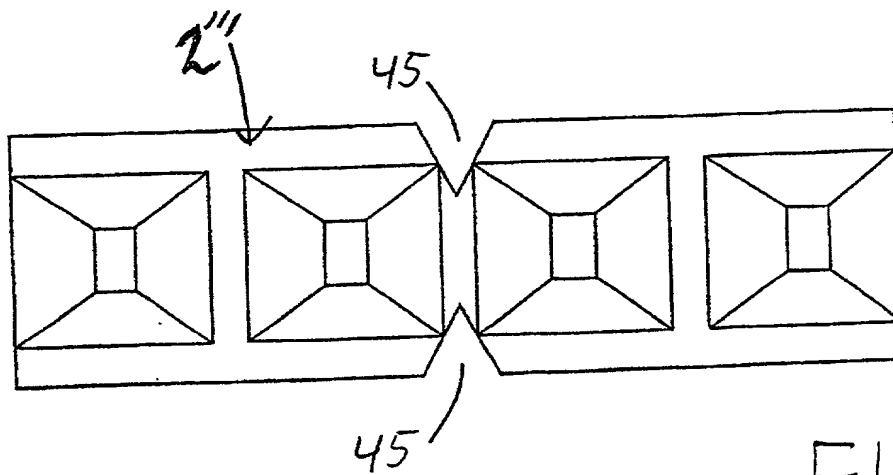
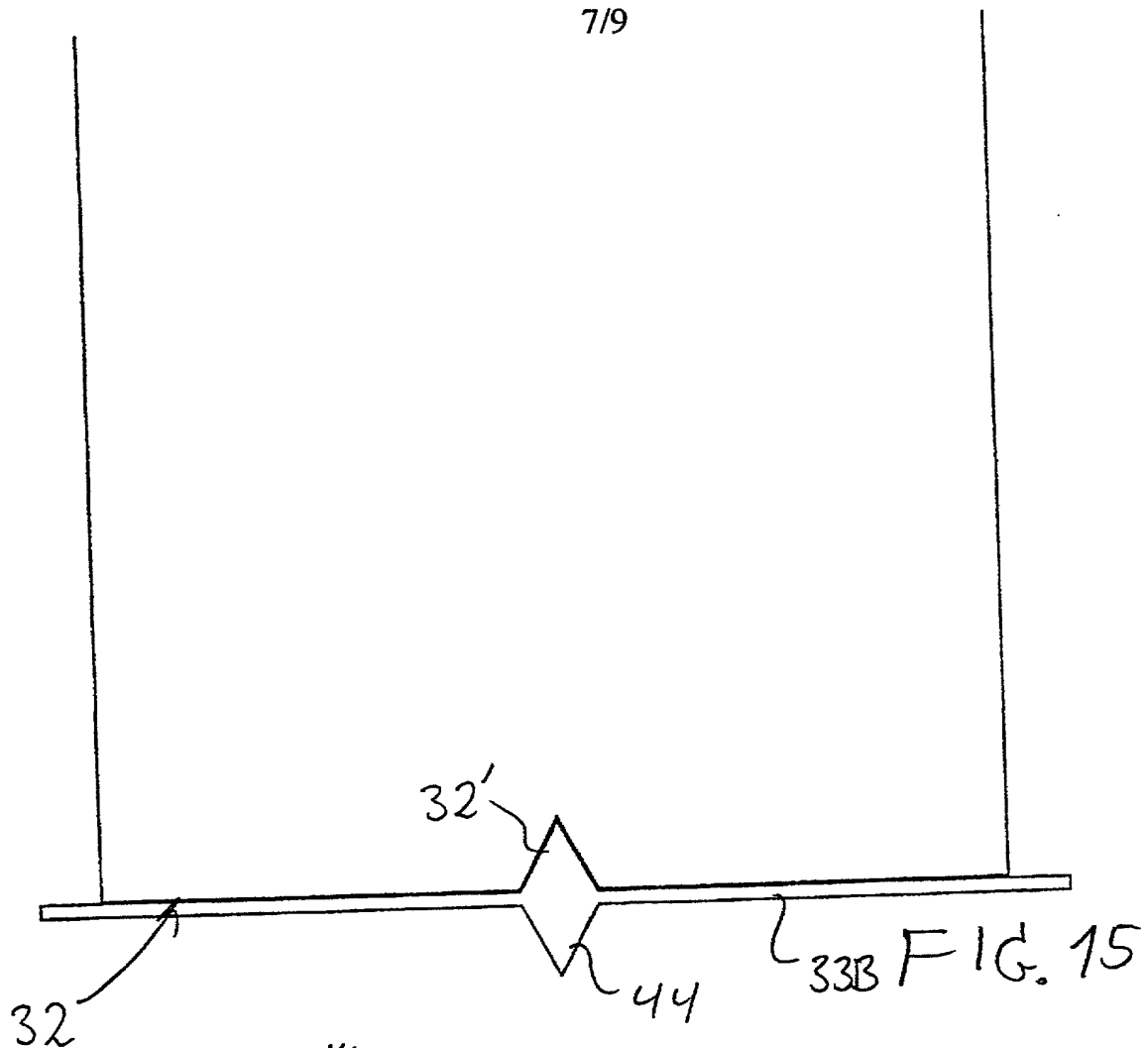


FIG. 13

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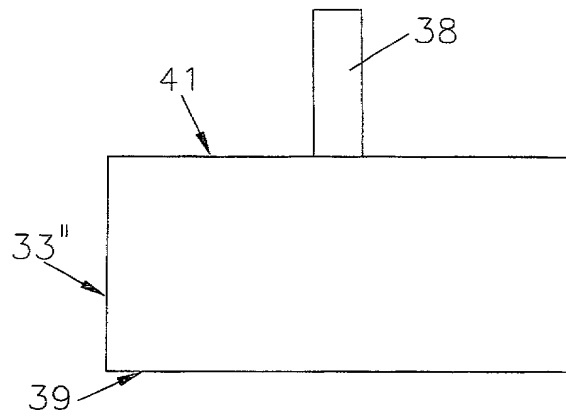


Fig. 17

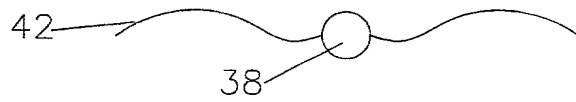


Fig. 17a

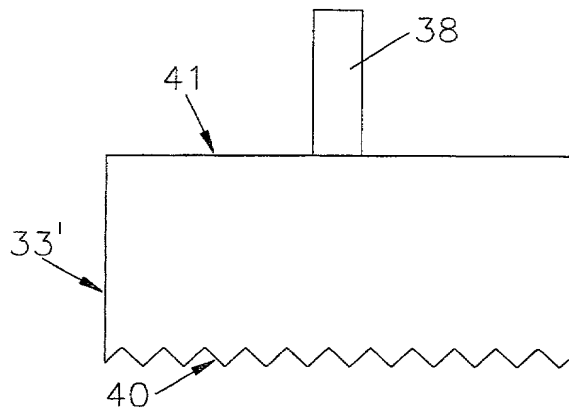


Fig. 18

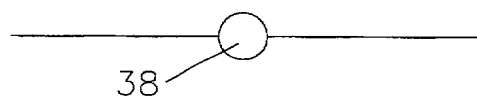


Fig. 18a

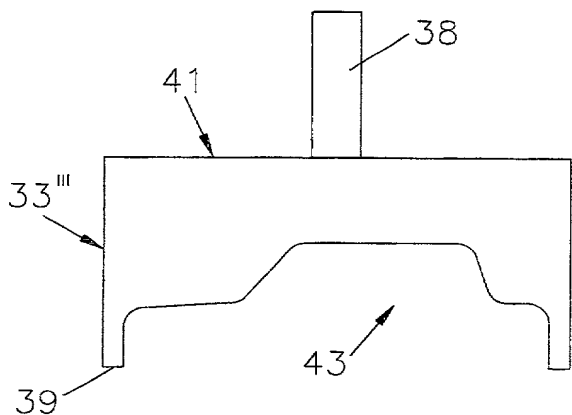


Fig. 19

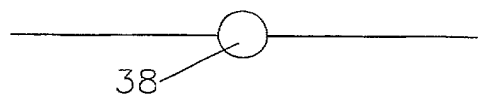


Fig. 19a

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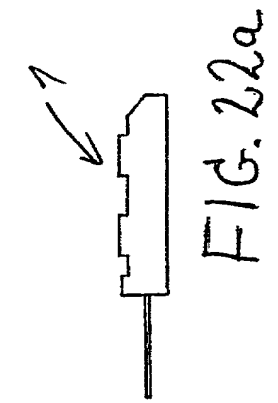


FIG. 20a

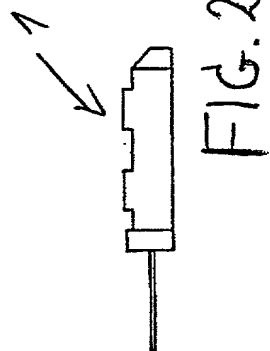


FIG. 21a

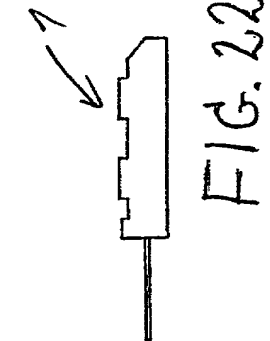


FIG. 22a

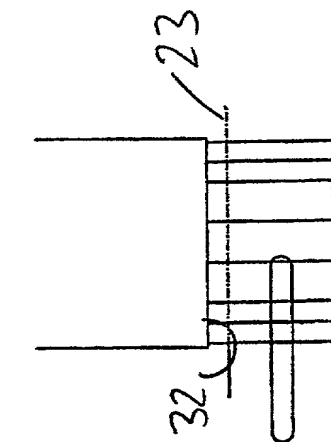


FIG. 20

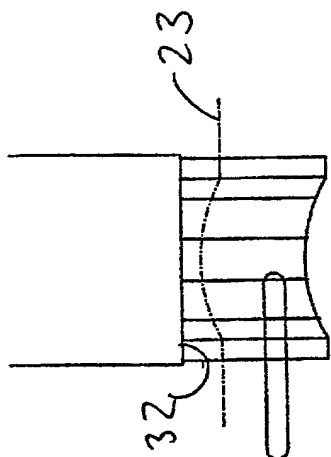


FIG. 21

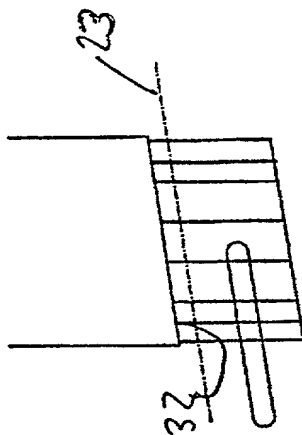


FIG. 22

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	<b>First Named Inventor</b>	RUD
	<b>COMPLETE IF KNOWN</b>	
	<b>Application Number</b>	/
	<b>Filing Date</b>	12/18/2001
	<b>Group Art Unit</b>	
	<b>Examiner Name</b>	

As a below named inventor, I hereby declare that:

My residence, mailing address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Shaping Confectionery Products by horizontal Extrusion

(Title of the Invention)

the specification of which

☒ is attached hereto

OR

☒ was filed on (MM/DD/YYYY)

06/14/2000

as United States Application Number or PCT International

(if applicable).

Application Number

PCT/DK00/00318

and was amended on (MM/DD/YYYY)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached? YES NO	
PA 1999 00875 PCT/DK00/00318	Denmark 06/14/2000	06.18.1999	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

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Signature

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